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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/601,460 | 06/23/2003 | Li An | 20.2862 | 9723 |

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| EXAMINER |
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SHRIVASTAV, BRIJ B

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| ART UNIT | PAPER NUMBER |
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2859

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/601,460 | AN ET AL. | |
| | Examiner | Art Unit | |
| | Brij B Shrivastav | 2859 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25 and 26 is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-22 and 27-30 is/are rejected.
- 7) ☒ Claim(s) 9, 23 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. Preliminary amendment dated June 25, 2004 has been received and entered. Claims 1, 17, 25 and 27 have been amended. The pending claims in the application are 1-30.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8, 10-22 and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blades et al (US 6,111,408), and further in view of Watanabe (US 6,147,490).

As regards to claim 1, Blades et al teach a method for obtaining nuclear magnetic resonance measurements in a borehole, wherein a fluid sample is exposed to the static magnetic field, a primarily inhomogeneous magnetic field environment to expose the sample (figure 1, numerals 10, 16 and 24; considering the borehole environment of very high and variable temperature and pressure, and imposition of the gradient magnetic field on the static magnetic field, Examiner interprets the static magnetic field to expose the fluid sample in the borehole as being primarily inhomogeneous). Further, Blades et al fail to teach application of an oscillating magnetic field to the fluid sample according to a preparation pulse sequence, including a J-edit pulse sequence for developing J modulation and acquiring the nuclear magnetic

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resonance measurements using a detection sequence, which includes at least one 180-degree pulse. Watanabe teaches application of an oscillating magnetic field to the fluid sample according to a preparation pulse sequence including a J-edit pulse sequence for developing J modulation and acquiring the nuclear magnetic resonance measurements using a detection sequence, which includes at least one 180-degree pulse (figures 1-4; column 1, lines 20-28; columns 4, lines 25-67, column 5, lines 1-13 and 23-65).

It would have been obvious to one of ordinary skill in the art to adapt oscillatory magnetic field pulse sequence for J modulation and detection sequence of Watanabe with the borehole measurement method of Blades et al to improve measurement conditions of sample surroundings improving quality of data obtained.

As regards to claim 17, Blades et al teach a method for characterizing formation fluids, wherein a nuclear magnetic resonance instrument is disposed in a borehole, including a fluid sample, which is exposed to the static magnetic field, a primarily inhomogeneous magnetic field (figure 1, numerals 10, 16 and 24; considering the borehole environment of very high and variable temperature and pressure, and imposition of the gradient magnetic field(s) on the static magnetic field in the borehole, Examiner interprets the static magnetic field to expose the fluid sample in the borehole as being primarily inhomogeneous). Further, Blades et al fail to teach application of an oscillating magnetic field to the fluid sample according to a preparation pulse sequence, including a J-edit pulse sequence for developing J modulation and acquiring the nuclear magnetic resonance measurements using a detection sequence, which includes at least one 180-degree pulse. Watanabe teaches application of an oscillating magnetic field to

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the fluid sample according to a preparation pulse sequence including a J-edit pulse sequence for developing J modulation and acquiring the nuclear magnetic resonance measurements using a detection sequence, which includes at least one 180-degree pulse (figure 1-4; column 1, lines 20-28; columns 4, lines 25-67, column 5, lines 1-13 and 23-65).

It would have been obvious to one of ordinary skill in the art to adapt oscillatory magnetic field pulse sequence for J modulation and detection sequence of Watanabe with the borehole measurement method of Blades et al to improve measurement conditions of sample surroundings improving quality of data obtained.

As regards to claim 27, Blades et al teach a nuclear magnetic resonance instrument, including a housing adapted to move in a wellbore; the housing having a magnet to induced a static magnetic field in a zone of interest, which being primarily inhomogeneous (figure 1, numerals 10, 16 and 24; considering the borehole environment of very high and variable temperature and pressure, and imposition of the gradient magnetic field on the static magnetic field, Examiner interprets the static magnetic field to expose the fluid sample in the borehole as being primarily inhomogeneous). In addition, Blades et al teach an antenna assembly disposed in the housing to induce an oscillating magnetic field and receive nuclear magnetic signals (figure 3, numerals 9 and 10). However, Blades et al fail to teach an electronic module including a memory to store instructions for performing a J-edit pulse sequence. Watanabe teaches an electronic module including a memory to store instructions for

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performing a J-edit pulse sequence (figures 3 and 4; numerals 11-14 column 1, lines 20-28; columns 4, lines 25-67, column 5, lines 1-13 and 23-65).

It would have been obvious to one of ordinary skill in the art to adapt electronic module including a memory to store instructions for performing a J-pulse sequence of Watanabe with the magnetic resonance instrument of Blades et al to execute J-pulse sequence for hydrocarbon identification in the wellbore fluid.

As regards claims 7,10, 11, 18, 19 and 28-30, Blade et al teach housing forming a part of drilling tool and a sampling tools for magnetic resonance measurements in an earth formation to detect hydrocarbons (figure 1).

As regards to claims 2-6, 8, 12-16, and 20-22, Blades et al do not teach J-edit pulse sequence to determine hydrocarbon composition in the fluid samples using different delay times and analyzing signal amplitudes. Watanabe teaches J-edit pulse sequence to determine hydrocarbon composition in the fluid samples using different delay times and analysis techniques to analyze signal amplitudes (figure 3 and 4). It would have been obvious to one of ordinary skill in the art to adapt J-edit pulse sequence and associated techniques to analyze hydrocarbon composition of Watanabe with the wellbore sampling techniques of Blades for commercial exploration of hydrocarbons in the earth formation.

Allowable Subject Matter

3. Claims 25 and 26 are allowed, as the prior art of record does not teach or suggest method for determining with a downhole tool an oil-to-water ratio in a fluid sample driving a total hydrogen index from the total nuclear magnetic resonance

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measurement to drive the oil-to-water ratio of the fluid sample from the hydrocarbon content and the total hydrogen index, in combination with the remaining limitations of the claims.

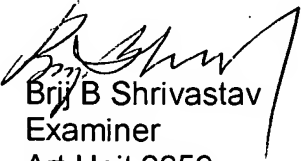
4. Claims 9, 23 and 24 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brij B Shrivastav whose telephone number is 571-272-2250. The examiner can normally be reached on 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 9, 2004


Brij B Shrivastav
Examiner
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